Meeting to Explore Paths Forward for Resolution of Orbital Counter Problem – Jan 28th, 2014-01-28

Attendance: Grant Minor, Don Jackson, Yuri Bilinsky, Max Kinakin, Joe Mildenberger, Noel Giffin, Anne Trudel

A history of the problem was provided including the recent difficulties. A summary of the measures taken in 2012 when the problem last arose is available on the RH e-log (https://elog.triumf.ca/TIS/RH-Cyclotron/2). Since then the following has occurred:

1. The system behaved acceptably for the second tank survey in 2012 and for both the shield-in and shield-out tank surveys in 2013. Although in both cases there was evidence of dropped readings in each revolution, the data was still usable as it was only one or two readings per revolution.
2. The orbital counter performed well for positioning the shine blockers for the 2014 shutdown.
3. The shield-in survey was able to be completed for the outer radii (X-Y in.) but the orbital counter malfunctioned for smaller radii dropping up to 20-30 readings per revolution.

For the purposes of completing the tank survey and providing usable data the requirements for the orbital counter are a precision of 0.5 degrees. At the perimeter of the machine 1 degree corresponds to 25 cm. Although the original requirement for the orbital counter was to achieve an 0.01 degree accuracy, it has never performed reliably at this level and so has not really been used for anything other than the tank survey.

The orbital counter and its readout are sufficiently complex that there could be a large number of causes for this intermittent problem. There is also no other area but on the tank itself where the system can be fully tested. Given the lack of manpower to study the problem, it was decided to forgo the shield-in survey.

The following course of action will be taken:

1. Only a limited portion of the vault needs to be accessed this shutdown and a local survey will be done manually for this job.
2. The intermittent problem may not recur and an attempt will be made to carry out the tank survey for the shield-out configuration at the usual time.
3. A proposal was made to investigate using the constant velocity of the bridge around the tank and collection of data at fixed time intervals as an alternate way, without use of knowledge of orbit location, to obtain a tank survey.
   To this end, the Remote Handling Group will take measurements this shutdown to ascertain the variation in the speed around an orbit and portion thereof and look to verify that this technique could work. A full implementation of this technique would have to wait until shutdown 2015 to allow time to modify the acquisition software for a fixed time interval acquisition.